

REMARKS

Prior to this Reply, Claims 1-41 were pending. Through this Reply, Claims 10 and 12 have been amended. No claims have been added or cancelled. Accordingly, Claims 1-41 are now at issue in the present case.

I. Amendments to the Specification

The specification has been amended to correct certain obvious typographical errors. No new matter has been added.

II. Rejection of Claims 1-6, 9-36, 40 and 41 Under 35 U.S.C. § 102(b)

The Examiner rejected Claims 1-6, 9-36, 40 and 41 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,781,363 to Rowan et al. (hereinafter "Rowan"). Applicants respectfully traverse the Examiner's rejection because Rowan does not teach all of the limitations of the claims.

Specifically, Claim 35 requires a voice coil motor to be "provided a first amount of electrical power over a first period of time to move said actuator arm" and to be "provided a second amount of electrical power of a second period of time to move said actuator arm ... wherein said first period of time is not equal to said second period of time" (emphasis added). The Examiner cites Col. 3, lines 7-23; Col. 3, lines 37-51; and, Col. 7, line 1 to Col. 8, line 43 of Rowan as teaching the above-quoted limitations. Applicants disagree.

As set forth in its Abstract, Rowan is directed to a system and method for determining the velocity and/or position of a coil driven actuator arm without the aid of servo signals. A sample-and-hold unit is used to measure no-motion coil voltage in the voice motor coil while applying a

predetermined current. Then, while the same magnitude (opposite direction) current is applied to move the actuator arm, the coil voltage is measured. The coil voltage is reduced by the measured no-motion coil voltage, producing a measurement of back-emf. The back-emf may be amplified by a predetermined factor to yield an estimation of velocity, and this amount may be integrated to provide a gauge of relative actuator arm position.

In Col. 3, lines 10-23, Rowan states:

In one implementation, a first analog voltage is measured across the voice coil while concurrently holding the actuator arm in a fixed position and generating a first electrical current (having a first magnitude and first direction) in the voice coil. Then, a signal representative of the first measured analog voltage is stored. Next, a second predetermined electrical current is generated in the voice coil. This current has the first magnitude but a second direction of flow opposite the first direction. Concurrently, a second analog voltage across the conductive coil is measured. An analog estimated velocity signal is produced by subtracting the stored signal from the measured second analog voltage. This signal can be integrated to produce an analog position signal. (emphasis added)

Furthermore, in Col. 3, lines 42-49, Rowan states:

Unlike the prior art, the invention more accurately estimates back-emf by actually measuring a no-motion coil voltage with a predetermined coil current, and then subtracting this value from the coil voltage during movement of the actuator arm using the same magnitude of current. The invention thus avoids inaccuracies that can arise when coil resistance varies from a nominal value due to factors such as temperature or manufacturing. (emphasis added)

In Col. 7, lines 14-40, Rowan states:

The steps 300 begin in task 302, which begins a procedure for calibrating the sample-hold unit 212. Task 302 begins with the actuator arm 104 being held in place by the latch. In this position, the actuator arm 104 is considered to be parked.

First, the servo controller 114 applies a predetermined coil current ($-I_c$) to the coil 110....The direction of this current is selected to urge the actuator arm 104 toward the crash stop (not shown). However, the crash stop prevents the arm 104 from

moving. Thus, the voltage across the coil (V_c) at this time is due entirely to coil resistance (R_c), with none of the voltage being attributable to back-emf. In task 304 the sample-hold unit 212 samples the coil voltage and stores this sampled signal. While this voltage is being sampled, the switch 218 must be closed.

Next, in task 306 the servo controller 114 applies an opposite predetermined coil current ($+I_c$) to move the actuator arm 104 away from the crash stop and toward the disk 102. In the illustrated embodiment, the coil current ($+I_c$) may be about one amp, maintained for about five milliseconds. Concurrently, the back-emf of the coil 110 is monitored to provide an estimation of actuator arm velocity. In particular, the switch 216 is set to couple the sample-hold unit 212 to the summer 210. The summer 210 therefore reduces the total coil voltage (V_c) by the coil voltage due to resistance, resulting in the back-emf (i.e., voltage due to the inductive component of the coil). During task 306, the switch 218 is open. (emphasis added)

As can be seen from the above-quoted sections of Rowan, when the first amount of electrical power is applied to the coil, the actuator arm is not moving. In contrast, Claim 35 requires a voice coil motor to be “provided a first amount of electrical power over a first period of time to move said actuator arm” (emphasis added).

In the interest of full disclosure, Applicants do note that Rowan (Col. 7, lines 48-53) states:

As part of task 306, the servo controller 114 may perform additional steps (not shown) to correct the actuator arm's velocity to a predetermined velocity. This is achieved by comparing the estimated velocity to the predetermined velocity, and either increasing or decreasing the coil current appropriately.

However, there is no mention of the relative duration of the coil currents. More specifically, Claim 35 requires a voice coil motor to be “provided a first amount of electrical power over a first period of time to move said actuator arm” and to be “provided a second amount of electrical power of a second period of time to move said actuator arm ... wherein said first period of time is not equal to said second period of time” (emphasis added). If the Examiner

believes that there is some disclosure of the relative duration of coil currents in Rowan, he is requested to specifically point to such disclosure in Rowan.

For at least the above reasons, Applicants submit that Claim 35 is patentably distinguishable from Rowan. For at least the same reasons, Applicants submit that the claims that depend from Claim 35 are likewise patentably distinguishable from Rowan.

Furthermore, for reasons similar to those provided with respect to Claim 35, Applicants submit that independent Claims 1 and 28 (and the claims that depend therefrom) are also patentably distinguishable from Rowan.

There are additional reasons why some of the dependent claims are patentably distinguishable from Rowan. Certain of those additional reasons are presented for some of the dependent claims below.

With respect to Claim 36, there is no disclosure in Rowan that “said first and second amounts of electrical power are equal.” If the Examiner believes otherwise, he is requested to specifically point to such disclosure in Rowan.

With respect to Claim 41, there is no disclosure in Rowan of the voice coil motor being “provided with a third amount of electrical power over a third period of time to move said actuator arm, wherein said third period of time is not equal to said first and second periods of time” (emphasis added). As described above, there is no mention of relative durations of coil currents in Rowan. If the Examiner believes otherwise, he is requested to specifically point to such disclosure in Rowan.

With respect to Claim 3, there is no disclosure in Rowan that “said first and second quantities of electrical power are equal.” If the Examiner believes otherwise, he is requested to point to such disclosure in Rowan.

With respect to Claim 5, there is no disclosure in Rowan that “a first proportioning value equal to an inverse of said first period of time is applied to a calculation of an amount of power to obtain said first quantity of electrical power, and wherein a second proportioning value equal to an inverse of said second period of time is applied to a calculation of an amount of power to obtain said second quantity of electrical power” (emphasis added). If the Examiner believes otherwise, he is requested to specifically point to such disclosure in Rowan.

With respect to Claim 10, there is no disclosure in Rowan that “at least one of said first and second periods of time are randomly determined.” If the Examiner believes otherwise, he is requested to specifically point to such disclosure in Rowan.

With respect to Claim 11, there is no disclosure in Rowan that “at least one of said first and second periods of time are pseudo-randomly determined.” If the Examiner believes otherwise, he is requested to specifically point to such disclosure in Rowan.

With respect to Claim 12, there is no disclosure in Rowan that “said first period of time is randomly determined, and wherein an algorithm used to calculate said first quantity of electrical power includes as a term a value that is inversely proportional to said randomly determined first period of time.” If the Examiner believes otherwise, he is requested to specifically point to such disclosure in Rowan.

With respect to Claim 13, there is no disclosure in Rowan that “said first period of time is pseudo-randomly determined, and wherein an algorithm used to calculate said first quantity of electrical power includes as a term a value that is inversely proportional to said pseudo-randomly determined first period of time.” If the Examiner believes otherwise, he is requested to specifically point to such disclosure in Rowan.

With respect to Claim 14, there is no disclosure in Rowan that “said second period of time is a multiple of said first period of time.” If the Examiner believes otherwise, he is requested to specifically point to such disclosure in Rowan.

With respect to Claim 18, there is no disclosure in Rowan of the steps of: “determining a velocity of said transducer head after said step of introducing a second quantity of electrical power; introducing for a third period of time a third quantity of electrical power to said voice coil motor to move said transducer head; determining a velocity of said transducer head after said step of introducing a third quantity of electrical power; introducing for a fourth period of time a fourth quantity of electrical power to said voice coil motor to move said transducer head, wherein said first, second, third and fourth periods of time are not equal” (emphasis added). If the Examiner believes otherwise, he is requested to specifically point to such disclosure in Rowan.

With respect to Claim 19, there is no disclosure in Rowan that “said first, second, third and fourth quantities of electrical power are equal.” If the Examiner believes otherwise, he is requested to specifically point to such disclosure in Rowan.

III. Rejections of Claims 7, 8, 37 and 38 Under 35 U.S.C. § 103(a)

The Examiner rejected Claims 7, 8, 37 and 38 under 35 U.S.C. § 103(a) as being unpatentable over Rowan in view of U.S. Patent No. 6,282,049 to Cameron et al. (hereinafter “Cameron”). Applicants believe that the rejections of Claims 7, 8, 37 and 38 are now moot in view of the arguments presented above.

IV. Claim 39

The Examiner has not provided any reason for rejecting Claim 39. Accordingly, Applicants believe that Claim 39 is patentably distinguishable from the cited references.

V. Amendments to Claims 10 and 12

Applicants note that Claims 10 and 12 have been amended to correct certain obvious errors. Importantly, such claims are not being amended to distinguish any prior art.

VI. Additional Claim Fees

In determining whether additional claim fees are due, reference is made to the Fee Calculation Table (below).

Fee Calculation Table

	Claims Remaining After Amendment		Highest Number Previously Paid For	Present Extra	Rate	Additional Fee
Total (37 CFR 1.16(c))	41	Minus	41	= 0	x \$18 =	\$ 0.00
Independent (37 CFR 1.16(b))	3	Minus	3	= 0	x \$86 =	\$ 0.00


As set forth in the Fee Calculation Table (above), Applicants previously paid claim fees for forty-one (41) total claims and for three (3) independent claims. Accordingly, Applicants believe that no additional claims fees are due. Nevertheless, Applicants hereby authorize the Commissioner to charge Deposit Account No. 50-2198 for any fee deficiencies associated with filing this paper.

VII. Conclusion

Applicants believe that the application appears to be in form for allowance. Accordingly, reconsideration and allowance thereof is respectfully requested.

The Examiner is invited to contact the undersigned at the below-listed telephone number regarding any matters relating to the present application.

Respectfully submitted,



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